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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/616,610 | 07/09/2003 | Yixiang Duan | S-100,580 | 3355 |
| 35068 | 7590 | 04/23/2007 | EXAMINER | |
| LOS ALAMOS NATIONAL SECURITY, LLC | | | MAYEKAR, KISHOR | |
| LOS ALAMOS NATIONAL LABORATORY | | | ART UNIT | PAPER NUMBER |
| PPO. BOX 1663, LC/IP, MS A187 | | | 1753 | |
| LOS ALAMOS, NM 87545 | | | | |
| SHORTENED STATUTORY PERIOD OF RESPONSE | | MAIL DATE | DELIVERY MODE | |
| 3 MONTHS | | 04/23/2007 | PAPER | |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

A12

| | | | |
|------------------------------|-----------------|---------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/616,610 | DUAN, YIXIANG | |
| | Examiner | Art Unit | |
| | Kishor Mayekar | 1753 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 09 February 2007.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1, 5-9, 12-15, 17 and 18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1, 5-9, 12-15, 17 and 18 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|---|
| <p>1)<input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2)<input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3)<input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.</p> | <p>4)<input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.</p> <p>5)<input type="checkbox"/> Notice of Informal Patent Application</p> <p>6)<input type="checkbox"/> Other: _____.</p> |
|---|---|

DETAILED ACTION

1. Applicant's arguments with respect to claims 1, 5-9 and 12-15 and new claims 17 and 18 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

2. Claims 1, 5, 17 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the recitations "sending plasma support gas", "such that active reaction gas" and "a layer of plasma support gas" are indefinite because it recites the gas without any correlation to the identical recitation.

In claim 5, the same is applied to claim 1 to the recited gas (two occurrences).

In claim 17, the same is applied to claim 1.

In claim 18, the same is applied to claim 5.

Claim Rejections - 35 USC § 102 and § 103

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an

international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 1, 6 and 12-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Dong et al. (US 7,079,370 B2), a reference cited in the last Office action. Dong's invention is directed to an apparatus and method for removing of surface oxides via fluxless technique electron attachment and remote ion generator. Dong discloses that the ion generator comprises the recited housing, discharge chamber, first electrode, second electrode, active reaction gas tube, and a plasma support gas tube (Fig. 7; paragraph crossing cols. 13 and 14; col. 9, lines 21-53; and col. 12, lines 21-52). Since Dong's ion generator comprises the same configuration as that of the claimed apparatus as shown in Fig. 3 and generates electrons from one of the first and second electrodes and the gas phase ionization, it anticipates the recited claims.

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5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dong '370 in view of Banks et al. (US 5,693,241). The difference between Dong as applied above and the instant claim is the provision of flowmeter. Banks, another reference cited in the last Office action, shows the limitation in a plasma surface treating apparatus (Fig. 2). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Dong's teaching as suggested by Banks because this would result in precise mixing and control flow of the reactive gas and other gas.

6. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dong '370 in view of Okamoto et al. (US 6,224,837 B1). The differences between Dong as applied above and the instant claim are the provision of the recited power source. Okamoto, another reference cited in the last Office action, shows the limitations in a corona discharge apparatus of the boosting of the DC power from the battery by a DC-DC converter prior to the corona discharge device (Fig. 4) and the use of a transformer in the case of using a voltage source with a frequency (Fig. 7). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified tong's teaching as suggested by Okamoto because this would result in providing proper voltage to be applied to the first and second electrodes.

As to the subject matter of claim 9, the selection of any of known equivalent batteries for the power source would be within the level of ordinary skill in the art.

7. Claims 17 and 18 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Dong '370 in light of Dong et al. (US 2004/0211675 A1). Dong as applied above further discloses in col. 14, lines 10-37 the use of the invention for the reflow of a solder bumped wafer such as the method provided in the co-pending U.S. application Serial No. 10/425,404 which is corresponding to US 2004/0211675 A1. In the copending application, Dong discloses in Fig. 9c the provision of two devices for generating electrons. Since the copending application shows the use of two devices for generating electrons and Dong discloses the use of the ion generator in the method of the copending application, Dong contemplates a plurality of ion generators in his invention. If not, the provision of a plurality of the ion generators would be within the level of ordinary skill in the art for treating larger surface and/or increasing the throughput.

Response to Arguments

8. Applicant's arguments filed 9 February 2007 have been fully considered but they are not persuasive because of the new ground of rejections as set forth in the paragraphs above.

Conclusion

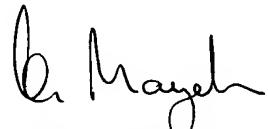
9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kishor Mayekar whose telephone number is (571) 272-1339. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Kishor Mayekar
Primary Examiner
Art Unit 1753